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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/642,226	08/18/2003	Akiko Hirao	241680US2SRD	2203

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EXAMINER	
ANGEBRANNDT, MARTIN J	

ART UNIT	PAPER NUMBER
1756	

DATE MAILED: 11/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/642,226	HIRAO ET AL.	
	Examiner	Art Unit	
	Martin J. Angebranndt	1756	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *8/18/03 & 4/12/05*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *11/18/05 & 4/12/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-10 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Egami et al.. "Photoisomeric-chromophore doped polymers for directional spatial filtering by optical threshold processing", J. Opt. Soc. Am. B vol. 15(7) pp. 1985-1991 (07/1998).

Egami et al.. "Photoisomeric-chromophore doped polymers for directional spatial filtering by optical threshold processing", J. Opt. Soc. Am. B vol. 15(7) pp. 1985-1991 (07/1998) uses disperse red is an azo chromophore which isomerizes about the N=N bond (page 1986/left column) and acts and a NLO chormophore (fig 1) and is mixed with ethylcarbazole and PVK which transport charge and placed between two ITO slides (page 1987/left column).

The claims do not preclude one compound/molecule fulfilling more than one of the functions.

4. Claims 1-20 are rejected under 35 U.S.C. 102(b) as being fully anticipated by WANG et al., "Multi-grating in photorefractive composities containing non-linear chromophore azo dye 1 n-butoxyl-2,5,dimethyl-4-(4'-nirrophenylazo)benzene", Proc. SPIE Vol. 3554 pp. 224-228 (08/1998).

WANG et al., "Multi-grating in photorefractive composities containing non-linear chromophore azo dye 1 n-butoxyl-2,5,dimethyl-4-(4'-nirrophenyl**azo**)benzene", Proc. SPIE Vol. 3554 pp. 224-228 (08/1998), describes a composition of BDMNPAB :PVK :TNK coated to a thickness of 100 microns between two glass slides provided with ITO electrode coatings (page 224-225). These are exposed to p-polarized HeNe lasers to record gratings. The filed applied is 92.4 V/micron (thickness) page 226 and 84 V/micron (figure 4).

The claims do not preclude one compound/molecule fulfilling more than one of the functions.

5. Claims 1-20 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Wang et al., "The electric fiel dependence of the laser induced holographic grating relaxation of a photorefractive polymer", Proc. SPIE Vol. 1775 pp. 262-270 (1992).

Wang et al., "The electric filed dependence of the laser induced holographic grating relaxation of a photorefractive polymer", Proc. SPIE Vol. 1775 pp. 262-270 (1992) teaches PMMA doped with 1-(4-nitrophenyl-**azo**) 2—naphtylisobutyrate (NNI) and p-diethyleamino-benzaldehyde diphenylhydrazone (DEH). DEH is a hole (charge) transport material. NNI undergoes isomerization and also is a NLO chromophore (abstract and page 263). This composition is placed between two ITO coated glass slides at a thickness of 3 microns or 220

mirons. (pages 263-264). Two argon ion laser beams were used to record holograms and samples are polled 5000 V/cm (thickness).

6. Claims 1-20 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Smith et al. "multiple grating formation in photorefractive polymers with azo dye chromophores", Proc. SPIE Vol. 2850 pp. 14-21 (1996).

Smith et al. "multiple grating formation in photorefractive polymers with azo dye chromophores", Proc. SPIE Vol. 2850 pp. 14-21 (1996) teaches PVK :TNF :DEANCST:disperse red 1 provided between two ITO coated slides to a thickness of 70 microns (page 16). The gratings were poled at 86 V/micron using two polarized HeNe lasers. The use of mixed polarized beams is also disclosed (one s and the other p polarized) on page 19.

7. Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al. "multiple grating formation in photorefractive polymers with azo dye chromophores", Proc. SPIE Vol. 2850 pp. 14-21 (1996), in view of Bertarelli et al., "Reversible switching of molecular non-linear optical properties of photochromic diarylethene systems", Synth. Metals Vol. 139 pp. 933-935 (01/2003) and/or Lafond et al., "Characterization of dye doped PMMA/PVK films as recording materials". Proc. SPIE 3417 pp. 216-227 (07/1998).

Bertarelli et al., "Reversible switching of molecular non-linear optical properties of photochromic diarylethene systems", Synth. Metals Vol. 139 pp. 933-935 (01/2003) teaches the photochromic and NLO (large hyperpolarizablility) properties of diarylethenes.

Lafond et al., "Characterization of dye doped PMMA/PVK films as recording materials". Proc. SPIE 3417 pp. 216-227 (07/1998) teaches the photoisomerization of diarylethenes and their compataibility with PVK.

It would have been obvious to modify the composition of Smith et al. "multiple grating formation in photorefractive polymers with azo dye chromophores", Proc. SPIE Vol. 2850 pp. 14-21 (1996) by replacing the NLO chromophore or the photoisomerizable azo dye with the diarylethenes taught by Bertarelli et al., "Reversible switching of molecular non-linear optical properties of photochromic diarylethene systems", Synth. Metals Vol. 139 pp. 933-935 (01/2003) or Lafond et al., "Characterization of dye doped PMMA/PVK films as recording materials". Proc. SPIE 3417 pp. 216-227 (07/1998) with a reasonable expectation of forming a useful holographic recording composition with contribution to the diffraction efficiency from both NLO and photoisomerization.

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Cammack et al. '841 (table 2, example 27 or 30), Hirao et al. '285 (example 1), Marder et al. '332 (26/10-22), Meerholtz et al. '267 (table 1), Tsukamoto et al. '538 [0148] and Marder et al. '994 (table 2) are cumulative to the rejection above.

Cattaneo et al. "photoinduced reversible optical gratings in photochromic diarylethene doped polymeric thin films", JOSA B. Vol. 19(9) pp. 2032-2038 (09/2002) and Tsujioka et al., "Organic bistable moleculart memory using photochromic diarylethene", Appl. Phys. Lett., Vol. 83(5) pp. 937-939 (08/2003) describe the use of diarylethenes in holographic recording

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin J. Angebranndt whose telephone number is 571-272-1378. The examiner can normally be reached on Monday-Thursday and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Martin J Angebranndt
Primary Examiner
Art Unit 1756

11/14/05